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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,624	08/05/2003	Takashi Kurumisawa	116485	5362

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EXAMINER	
BODDIE, WILLIAM	
ART UNIT	**PAPER NUMBER**
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/633,624	KURUMISAWA ET AL.	
	Examiner	Art Unit	
	William L. Boddie	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,2,4-6,12 and 13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,4-6,12 and 13 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In an amendment dated, April 11th, 2007, the Applicant amended claim 5, cancelled claims 7-11 and added new claims 12-13. Currently claims 1-2, 4-6 and 12-13 are pending.

Response to Arguments

2. Applicant's arguments filed April 11th, 2007 have been fully considered but they are not persuasive.

3. On page 8 of the Remarks, the Applicants argue there is not motivation to modify Greier with Kim, as Greier already has a widened viewing angle.

4. The Examiner respectfully disagrees. The motivation in its entirety reads, "to visually combine the viewing angles so they widen an overall viewing angle of the display." Greier never expressly discloses selecting the grayscale values based on desired observation directions. Kim discloses setting the grayscales such that the grayscales work together to create a wider viewing angle by applying luminances for a first and second viewing angle. Thus it is the Examiner's belief that when one of ordinary skill in the art was presented with the two inventions by Greier and Kim would be motivated to incorporate the cooperation grayscale method of Kim in the device of Greier. The motivation being that the suitable viewing angle will be increased more efficiently and symmetrically. As such there appears to the Examiner to be proper motivation for one of ordinary skill in the art to apply luminances for a first and second viewing angle.

5. On page 8, the Applicants further argue that Kim does not disclose the recited values of +30 and –30 degrees.

6. It has always been the Examiner's belief that the ±30-degree observing angle was an obvious range that would have been achieved without undue experimentation. Kim discloses selecting two grayscales for a positive and negative degree viewing angle. Kim is silent as to what exact degrees are selected, but again, the ±30-degree observing angle is seen as an obvious range that is achievable after reasonable experimentation.

7. Again on page 8, the Applicants argue that Kim and Greier are incompatible. Specifically the Applicants argue that methods of modifying voltages of pixels are different for Greier and Kim.

8. The Examiner respectfully disagrees. The patterns of application of alternating voltages are instead similar and even identical for some embodiments. The Applicants are pointed to figure 15 of Greier and figure 1a of Kim (col. 4, line 65 – col. 5, line 3), which disclose identical checkerboard patterns for modifying voltages. Therefore the two systems of Kim and Greier are seen as compatible and combinable.

9. On page 9 of the Remarks, the Applicants argue that the combination of Kim with Greier would render Greier unsuitable for its intended purpose. Specifically, the Applicants argue that Kim would work to increase the mid tone levels of the display panel. It is these mid tone levels that Greier is avoiding.

10. The Examiner respectfully disagrees. As shown above, Kim discloses intensity pattern levels that are identical to those of Greier. Furthermore, simply because Kim

discloses resistor chains does not require more mid tone level intensities. In fact Greier also discloses providing circuitry for the full range of gray scales in figure 26. Applicants have not shown that Kim specifically increases the number of mid tone gray scales. If anything Kim also seems disinclined to supply midtone gray scales to the display panel. As such combining Kim with Greier is not seen as destroying Greier's invention.

11. Again on page 9, the Applicants argue that the combination of Kim with Greier would sufficiently render the display useless.

12. The Examiner must again disagree. The Applicants only proof is the resistor chains of Kim, which allegedly would reduce the voltages applied to all but the first pixel in each grouping. Additionally, it is unclear as to why all but the first pixel in each grouping would receive reduced voltages. Kim seems to merely offer a different set of grayscale voltages for each viewing angle characteristic. The application of these voltages is in patterns that are very similar to those of Greier. As such Applicants contention that combining Kim with Greier would create a useless display is not persuasive.

13. Applicant's remaining arguments with respect to claim 5 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

14. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

15. Claims 12-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, claims 12 and 13 require that the same grayscale be applied to two different color sub pixels and that subpixels have the same grayscale value prior to resolution conversion, respectively. While there appears to be minimal support for these limitations in figure 3, there is no other discussion of these limitations throughout the specification as to their purpose or advantage.

Additionally, should the original sub pixels be required to have the same grayscale value, as in claim 13, this would require that the original data be only be shades of gray. This seems somewhat contradictory to the vast majority of the Applicants specification which details working to ensure proper color balance amongst red, green and blue.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. Claims 5-6 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Keely, Jr. et al. (US 6,750,875).

With respect to claim 5, Keely discloses, an image display device, comprising:

a display unit (47 in fig. 3);

a resolution conversion device that converts original image data (data that has yet to be compressed; also note the disclosure of image scaling in col. 8, lines 49-61) for a single pixel, including sub pixels corresponding to a plurality of colors (col. 8, lines 43-46), to resolution-converted image data including image data of first, second and third pixels (R1-R3 for example in C1/R1 in fig. 5b; bias value image data is considered part of the image data as it determines the distribution of the luminance amongst the sub-pixels; col. 11, lines 60-63) each having sub pixels corresponding to a plurality of colors (clear from fig. 5b);

a viewing angle range adjustment device (48 in fig. 3) that sets grayscale values of the pixels of the resolution-converted image data (for example - col. 12, lines 1-9; any manipulation of the luminance that was intended for the display sub-pixels will inherently alter the viewing angle range); and

a display device (47 in fig. 3) for displaying the resolution-converted image data on the display unit;

wherein after converting the resolution (order of operation is inherent, see below discussion), the viewing angle range adjustment device sets different gray scale values for the same color sub pixels of the first, second, and third pixels (col. 11, line 60 – col. 12, line 9; also note col. 13, lines 45-49).

As to the additional limitation requiring that the resolution conversion be performed prior to adjusting the viewing angle, this order of processes is seen as

inherently required by the combination of devices. The resolution conversion process, disclosed by Keely, introduces additional data. Keely's device manipulates the grayscale of each subpixel to produce a specific pattern of grayscales amongst the subpixels to generate a specific luminance (col. 11, line 56 – col. 12, line 9).

If the original data were set to the pattern determined by the bias data of Keely, and then converted to different screen resolution, by the disclosed image scaling, Keely's pattern would be destroyed and the desired luminance would not be achieved. As such it would have been required that the resolution conversion process must occur prior to instilling the bias data in the display data.

With respect to claim 6, Keely discloses, the image display device according to claim 5 (see above), each subpixel corresponding to each color of R, G and B (fig. 5b), the viewing angle range adjustment device comprising:

a lookup table that stores display characteristics of the display unit for each color of R, G, and B; and a device that determines the grayscale values of the sub pixels for each color with reference to the lookup table (col. 14, lines 17-30).

With respect to claim 12, Keely discloses, the image display device according to claim 5 (see above), the viewing angle range adjustment device setting the same grayscale value for two different color sub pixels of the first and second pixels (for example col. 12, lines 1-9; discloses, gray colors where each subpixel (r,g,b) in sub-component would have the same grayscale).

With respect to claim 13, Keely discloses, the image display device according to claim 5 (see above), sub pixels of the single pixel before converting the resolution

have the same grayscale values (see col. 12, lines 1-9; which discloses displaying medium gray, which would require that the original data be a gray as well, thus ensuring the same grayscale values for each of the sub pixels).

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greier et al. (US 6,801,220) in view of Biggs (US 5,866,682) and further in view of Kim et al. (US 5,877,737).

With respect to claim 1, Grier discloses, an image display device, comprising: a display unit, a viewing angle range adjustment device that sets grayscale values of adjacent pixels of image data so that the grayscale values of the adjacent pixels are different (col. 13, lines 11-32; also note the checkerboard pattern of luminance of fig. 20), and a display device for displaying the image data on the display unit (112 in fig. 3).

Greier does not expressly disclose, a resolution conversion device that converts original image data for a single pixel to resolution converted image data including image data of two adjacent pixels, wherein the adjacent pixels have the same grayscale values upon resolution conversion.

Biggs discloses, a resolution conversion device (fig. 2) that converts original image data (fig. a, for example) for a single pixel to resolution converted image data

including image data of two adjacent pixels (fig. 4b, for example), each of the adjacent pixels having the same grayscale values. (col. 3, lines 51-63)

At the time of the invention it would have been obvious to one of ordinary skill in the art to convert the incoming video signals of Greier, to automatically copy the image data to fit the resolution of the device as taught by Biggs, and subsequently adjusting the subpixel luminances as taught by Greier.

As to the additional limitation requiring that the resolution conversion be performed prior to adjusting the viewing angle by ensuring a checkered pattern of gray scales, this order of processes is seen as inherently required by the combination of devices. The resolution conversion process, of Biggs, essentially introduces additional data. Greier's device, however, manipulates the grayscale of each pixel to produce a specific pattern of grayscales amongst the pixels (see figs. 13-21).

If the original data were set to the checkered pattern of Greier, and then converted to the screen's resolution, by Biggs, Greier's pattern would be destroyed and the benefits of a wider viewing angle would not be enjoyed.

Neither Greier nor Biggs expressly disclose, what occurs in a case that a vertical observation direction to a surface of the display unit is a 0 degree observation direction; the viewing angle range adjustment device sets grayscale value of one of the pixel and the adjacent pixel based on display characteristics of a -30 degrees observation direction and sets grayscale value of the other one of the pixel and the adjacent pixel based on display characteristics of a +30 degrees observation direction.

Kim discloses, in a case that a vertical observation direction to a surface of the display unit is a 0 degree observation direction; the viewing angle range adjustment device sets grayscale value of one of the pixel and the adjacent pixel based on display characteristics of a -30 degrees observation direction and sets grayscale value of the other one of the pixel and the adjacent pixel based on display characteristics of a +30 degrees observation direction (col. 2, lines 14-27, discloses selecting two sets of grayscale values based on producing a widened viewing angle characteristic.)

While Kim does not expressly discuss a ±30 viewing angle characteristic is specifically used in the case of a 0 degree observation direction, this viewing angle is seen as being included in the widened viewing angle disclosed by Kim.

As such it would have been obvious to one of ordinary skill in the art at the time of the invention to use a display characteristic of ±30°. This angle being optimum it would have been a motivated and obvious selection for use in Kim's display.

Biggs, Kim and Greier are all analogous art because they are from the same field of endeavor namely, matrix display control circuitry and methods of displaying data.

At the time of the invention it would have been obvious to one of ordinary skill in the art to select the gray scale values of Greier and Biggs, as taught by Kim.

The motivation for doing so would have been to visually combine the viewing angles so they widen an overall viewing angle of the display (Kim, col. 2, lines 20-23).

With respect to claim 2, Greier, Kim and Biggs disclose, the image display device according to claim 1 (see above).

Greier further discloses, the viewing angle range adjustment device setting the difference between grayscale values of the adjacent pixels in the vertical direction to be more than a predetermined grayscale value (col. 18, lines 55-58, discusses determining an ideal difference between grayscale values).

With respect to claim 4, Greier, Kim and Biggs disclose, the image display device according to claim 1 (see above).

Greier further discloses, the viewing angle range adjustment device comprising: a lookup table that stores the display characteristics of the display unit (col. 15, lines 12-14), and a device that determines the grayscale value of each pixel with reference to the lookup table (col. 15, lines 14-26).

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wlb
7/17/07

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